

WHAT IS CLAIMED IS:

1. An electro-optical device, comprising:
a plurality of scanning lines and a plurality of data lines;
a combination of a switching element and a pixel electrode provided
5 corresponding to each crossing between the scanning lines and the data lines;
a conductive interlayer that electrically connects the corresponding
switching element and the corresponding pixel electrode; and
a peripheral circuit containing leads that comprises the same layer as
the conductive layer constituting the conductive interlayer, and drives the switching
10 element.

2. The electro-optical device according to claim 1, the conductive
interlayer being connected to an electrode of the switching element via a first contact
hole provided corresponding to the electrode, whereas the pixel electrode is connected
to the switching element via a second contact hole.

15 3. The electro-optical device according to claim 1,
each pixel electrode being provided with a storage capacitor of which a
first end is connected to the pixel electrode and a second end is commonly connected,
and
the conductive interlayer functioning as a part of an electrode
20 constituting the storage capacitor.

4. The electro-optical device according to claim 1,
the conductive interlayer having a light-shading effect, and
part of light which passes through or is reflected by the pixel electrodes
being regulated by the conductive interlayers.

25 5. An electronic apparatus comprising an electro-optical device according
to claim 1.

6. An electro-optical device, comprising:
first, second, and third conductive layers, formed in that order, the third
conductuve layer having a resistance which is lower than a resistance of the first
30 conductive layer;
a plurality of scanning lines comprising the first conductive layer;
a plurality of data lines comprising the third conductive layer and
formed in a generally perpendicular manner relative to the scanning lines so as to
cross the plurality of scanning lines;

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a combination of a switching element and a pixel electrode provided corresponding to each crossing between the scanning lines and the data lines;

a conductive interlayer comprising the second conductive layer that electrically connects the switching element and the corresponding pixel electrode; and
5 a peripheral circuit which is provided with leads comprising the first, second, and third conductive layers and drives each switching element.

7. The electro-optical device according to claim 6, the conductive interlayer being connected to an electrode of the switching element via a first contact hole provided corresponding to the electrode, whereas the pixel electrode is connected 10 to the switching element via a second contact hole.

8. The electro-optical device according to claim 6, the peripheral circuit having parallel leads in which a lead comprising the first conductive layer and a lead comprising the second conductive layer are electrically connected in parallel in each parallel lead.

15 9. The electro-optical device according to claim 8, the parallel leads being branched from leads comprising the third conductive layer and being used in intersections with other leads different from the leads comprising the third conductive layer.

10. The electro-optical device according to claim 8, the peripheral circuit comprising the third conductive layer including:

20 h image signal lines that supply image signals in response to h data lines, wherein h is an integer of at least two; and

sampling switches, each being provided to the corresponding data line, that sample the corresponding image signal among the image signals supplied to the h 25 image signal lines in response to a predetermined sampling signal, and supply the image signal to the corresponding data line,

wherein the parallel leads are used as at least parts of leads which are branched from the image signal lines towards the sampling switches.

11. The electro-optical device according to claim 8, the lead comprising 30 the second conductive layer of the parallel leads passing through between third and fourth contact holes which expose the lead comprising the first conductive layer, and

the lead comprising the third conductive layer of the parallel leads being provided a position corresponding to the third or fourth contact hole and being

electrically connected to a fifth contact hole which exposes the lead comprising the second conductive layer.

12. The electro-optical device according to claim 11, the lead comprising the second conductive layer of the parallel leads being provided between the third and fourth contact holes and being connected to the lead comprising the first conductive layer in one contact hole or a plurality of contact holes.

13. The electro-optical device according to claim 8, the lead comprising the second conductive layer of the parallel leads passing through between third and fourth contact holes which expose the lead comprising the first conductive layer, and

10 the lead comprising the third conductive layer of the parallel leads being provided a position different from the third and fourth contact holes and is electrically connected to a sixth contact hole which exposes the lead comprising the first conductive layer.

14. The electro-optical device according to claim 13, the lead comprising the second conductive layer of the parallel leads being provided between the third and fourth contact holes and being connected to the lead comprising the first conductive layer in one contact hole or a plurality of contact holes.

15 15. The electro-optical device according to claim 6, the peripheral circuit comprises leads comprising the first, second, and third conductive layers in a partial portion thereof.

20 16. The electro-optical device according to claim 6, each pixel electrode being provided with a storage capacitor of which a first end is connected to the pixel electrode and a second end is commonly connected, and

the conductive interlayer functioning as a part of an electrode
25 constituting the storage capacitor.

17. The electro-optical device according to claim 16, wherein the storage capacitor includes:

a first capacitor comprising the electrode of the switching element, the capacitor line composed of the second conductive layer, and a gate oxide film of the switching element provided therebetween, and

30 a second capacitor comprising the conductive interlayer, the capacitor line, and an insulating interlayer provided therebetween.

18. The electro-optical device according to claim 6,
the conductive interlayer having a light-shading effect, and
part of light which passes through or is reflected by the pixel electrodes
being regulated by the conductive interlayer.

5 19. The electro-optical device according to claim 6, the first conductive
layer comprising polysilicon.

20. The electro-optical device according to claim 6, the third conductive
layer comprising aluminum.

10 21. The electro-optical device according to claim 6, the second conductive
layer comprising a material having a melting point which is higher than that of a
material constituting the third conductive layer.

22. An electronic apparatus comprising an electro-optical device according
to claim 6.

15 23. An electro-optical device, comprising:
a plurality of scanning lines and a plurality of data lines;
a combination of a switching element and a pixel electrode provided
corresponding to each crossing between the scanning lines and the data lines;
a conductive interlayer that electrically connects the switching element
and the corresponding pixel electrode;

20 a peripheral circuit for driving the switching element; and
leads connected to the peripheral circuit that comprise the same layer
as a conductive layer which constitutes the conductive interlayer.

25 24. The electro-optical device according to claim 23, the leads crossing
beneath at least one image signal line which comprises the same layer as a conductive
layer which constitutes the data lines.

26. The electro-optical device according to claim 24, the at least one image
signal line being a plurality of image signal lines, each image signal line being
connected to the corresponding lead, and these leads have substantially the same size.

30 27. The electro-optical device according to claim 23, further comprising a
first conductive layer which comprises the same layer as the conductive layer
constituting the data lines, a second conductive layer which comprises the same layer
as the conductive layer constituting the data lines and is formed at a position distant
from the first conductive layer, and a third conductive layer which comprises the same
layer as the second conductive layer of the switching element, the third conductive

layer being electrically connected with the first conductive layer and the second conductive layer via a contact holes.

27. The electro-optical device according to claim 26, the leads being electrically connected to the third conductive layer via at least one contact hole.

5 28. The electro-optical device according to claim 27, the third conductive layer comprising polysilicon.

29. The electro-optical device according to claim 27,
wherein each lead is electrically connected to the third conductive layer via at least three contact holes.

10 30. The electro-optical device according to claim 26,
wherein an image signal line which comprises the same layer as the conductive layer constituting the data lines is arranged between the first conductive layer and the second conductive layer.

15 31. An electronic apparatus comprising an electro-optical device according to claim 23.

32. A method for making an electro-optical device comprising a plurality of scanning lines, a plurality of data lines, and a combination of a switching element and a pixel electrode provided at a position corresponding to each crossing between the scanning lines and the data lines, the method comprising:

20 forming the switching element at the position corresponding to each crossing between the scanning lines and the data lines;

forming a conductive interlayer connected to the switching element and leads used in a peripheral circuit for driving the switching element, by using the same conductive layer; and

25 forming the pixel electrode connected to the conductive interlayer.

33. A method for making an electro-optical device comprising a plurality of scanning lines, a plurality of data lines, and a combination of a switching element and a pixel electrode provided at a position corresponding to each crossing between the scanning lines and the data lines, the method comprising:

30 after forming the scanning lines and leads used in a peripheral circuit for driving the corresponding switching element by using the first conductive layer, and forming the switching element at the positions corresponding to each crossing between the scanning lines and the data lines;

forming a conductive interlayer connected to the switching element and leads used in a peripheral circuit for driving the corresponding switching element, by using a second conductive layer;

5 forming leads used in the data lines and the peripheral circuit by using a third conductive layer; and

forming the pixel electrode connected to the conductive interlayer.